FW: Triumph Foods Disposal of CB Formalin
Steve Enyart
to:
Nicole Cruise, Nicole Cruise
09/01/2009 05:11 PM
Cc:
"'Carl Oyler'", "'Steve S'", plilly, "'Jennifer Bagwell'", "'Derek Petry'"
Show Details

Nicole,

I called your office at 4:05 this afternoon and left you a voice message regarding the status of our determination of the CB Formalin.

Below is the email to the City of St. Joseph POTW that I originally initiated in an attempt to dispose of the one gallon container after talking with you on 8/6/09.

It also documents that I had spoken with city staff on the phone prior to the email about this issue as well.

I had since called the staff at least two other times since then but my calls were not returned until this morning.

The City of St. Joseph has now told me that they are not comfortable with us using the CB Formalin manufacturer's recommended method of breaking down the Formaldehyde in the CB Formalin in Sodium Formate.

I will contact Safety Kleen get this material profiled and pay them to dispose of it or see if they will take it once we convert it over to Sodium Formate and dispose of it.

I will stick with this and keep you informed of our progress.

Thanks.

Steve Enyart
Safety Manager
senyart@triumphfoods.com
5302 Stockyards Expressway
St. Joseph, MO 64504
816-396-2825

From: Steve Enyart [mailto:senyart@triumphfoods.com]
Sent: Thursday, August 06, 2009 10:22 AM
To: 'jhood@ci.st-joseph.mo.us'
Cc: 'Jennifer Bagwell'; 'coyler@triumphfoods.com'; 'dpetry@triumphfoods.com'; 'Steve Schmidt'; 'Patt Lilly'; 'sdeweese@ci.st-joseph.mo.us'
Subject: Triumph Foods Disposal of CB Formalin

Jane,

Thank you for reviewing the disposal process for our 1 gallon container of CB Formalin which contains formaldehyde.

Per our telephone conference, I am attaching the following:

- MSDS for the CB Farmalin
- MSDS for the Formaldetox

- Instructions for how to use the Formaldetox

We are hopeful that we can use this process to safely breakdown the formaldehyde into constituents which would stay within the regulatory disposal parameters.

Please contact us, either by phone or email, if you have any further questions. We look forward to your direction in this matter.

Thank you.

Steve Enyart
Safety Manager
senyart@triumphfoods.com
5302 Stockyards Expressway
St. Joseph, MO 64504
816-396-2825

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: CB FORMALIN

(Product as sold: concentrate)
(Product as used by consumer: diluted)

Catalog number: 111

General use: Fixative in histology and surgical pathology.

Description of product as sold: Aqueous solution of formaldehyde and phosphate buffer.

Description of product as used by consumer: Aqueous solution of formaldehyde and phosphate buffer.

Manufacturer	Emergency contact information			
Anatech Ltd. 1020 Harts Lake Road Battle Creek, MI 49037 USA	Health:	Anatech Ltd.	800-262-8324	8 am - 5 pm ET, M-F
	Transportation:	CHEMTREC	800-424-9300	24 hours

2. COMPOSITION AND INFORMATION ON INGREDIENTS

Product as sold (concentrate)

Component	CAS #	Exposure limits
Formaldehyde (18.5% v/v)	50-00-0	0.75 ppm (OSHA 8 hour TWA) 2.0 ppm (OSHA 15 minute STEL) 0.5 ppm (OSHA Action Level) 0.3 ppm (ACGIH Ceiling) 0.1 ppm (NIOSH Ceiling) 20 ppm (NIOSH IDLH*) * Immediately dangerous to life and health
Methanol (5.5% v/v) (stabilizer in formaldehyde)	67-56-1	200 ppm (OSHA, NIOSH, ACGIH 8 hour TWA) 250 ppm (ACGIH Ceiling 6000 ppm (NIOSH IDLH*) * Immediately dangerous to life and health
Disodium phosphate (4.6% w/w)	7558-79-4	Generally considered not hazardous.
Monosodium phosphate (1.2% w/w)	7558-80-7	Generally considered not hazardous.

2. COMPOSITION AND INFORMATION ON INGREDIENTS (continued)

Product as used (diluted by consumer)

Component	CAS #	Exposure limits
Formaldehyde (3.7% v/v)	50-00-0	0.75 ppm (OSHA 8 hour TWA) 2.0 ppm (OSHA 15 minute STEL) 0.5 ppm (OSHA Action Level) 0.3 ppm (ACGIH Ceiling) 0.1 ppm (NIOSH Ceiling) 20 ppm (NIOSH IDLH*) * Immediately dangerous to life and health
Methanol (1.1% v/v) (stabilizer in formaldehyde)	67-56-1	200 ppm (OSHA, NIOSH, ACGIH 8 hour TWA) 250 ppm (ACGIH Ceiling 6000 ppm (NIOSH IDLH*) * Immediately dangerous to life and health
Disodium phosphate (0.9% w/w)	7558-79-4	Generally considered not hazardous.
Monosodium phosphate (0.2% w/w)	7558-80-7	Generally considered not hazardous.

3. HAZARDS IDENTIFICATION

Emergency overview

Clear, colorless liquid. Strong odor of formaldehyde.

Caution. Contains formaldehyde. Toxic by inhalation and if swallowed. Irritating to the eyes, respiratory system, and skin. May cause sensitization by inhalation or by skin contact. Risk of serious damage to eyes. Potential cancer hazard; repeated or prolonged exposure increases the risk.

Potential health effects
(Human health effects only; animal effects in Section 11: Toxicological Information.)

Primary route(s) of exposure: Eyes, skin and inhalation.

Inhalation: Formaldehyde vapors are irritating to the nose, throat and lower respiratory system. Human systemic effects by inhalation include olfactory, pulmonary and personality changes.

Eye: Contact of liquid or vapor with eyes may cause irritation or burns.

Skin: Contact of liquid with skin may cause irritation.

Ingestion: Ingestion of formaldehyde is likely to produce seriously adverse effects on the gastrointestinal system. Violent vomiting and diarrhea leading to collapse have been reported.

3. HAZARDS IDENTIFICATION (continued)

Chronic effects: Formaldehyde is a carcinogen and sensitizer. Allergic reactions, including contact dermatitis resembling eczema, can occur with repeated exposures. Long term exposure increases the risk of lung and nasopharyngeal cancer, as well as asthma. Individuals can become acclimated to various formaldehyde vapor concentrations.

Signs and symptoms: Affected skin will appear dry, tough and perhaps cracked. Affected corneas may appear cloudy; eyes may water and become reddened. Effects on the gastrointestinal tract may include nausea and/or vomiting. Effects on the respiratory system may include coughing and difficulty in breathing. Medical condition known to be aggravated by exposure to this solution include asthma.

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air if coughing or difficulty in breathing is experienced. Consult a physician if symptoms persist or worsen. Administer oxygen or artificial respiration as needed.

Eye: Flush eyes for at least 15 minutes in an eyewash station. If symptoms persist after washing, consult a physician.

Skin: Remove contaminated clothing, including footwear; wash before reuse or discard. For minor exposure, wash affected area with water and mild soap, rinsing thoroughly; apply a good quality skin lotion. In cases of prolonged, repeated or extensive exposure, rinse affected area or entire body for at least 15 minutes. For severe conditions, consult a physician.

Ingestion: Call a poison control center immediately. If victim is conscious, have him/her drink several glasses of water to dilute the solution. Induce vomiting only upon the advice of a physician or poison control authority.

Note to physician: CB Formalin is a histological fixative. If ingested, it will fix lining cells of the gastrointestinal tract.

5. FIRE FIGHTING MEASURES

Flammable properties

Flash point: For concentrate: 132°F (55.6°C), closed-cup.
For diluted solution: >200°F (>93°C), closed-cup.

Flammable limit: Not determined.

Autoignition temperature: Not determined.

Flammability classification: For concentrate: Combustible liquid (OSHA).
For diluted solution: Combustible liquid (OSHA).

Flame propagation: None.

Hazardous products of combustion: Emits toxic vapors (formaldehyde).

Extinguishing media: ABC rated portable fire extinguishers should be used. Professional fire fighters may use water spray, dry chemical or carbon dioxide.

Fire fighting instructions: Sealed chemical suits and self contained breathing apparatus are necessary for fighting formaldehyde fires involving substantial volumes of this product.

6. ACCIDENTAL RELEASE MEASURES

The size of a spill is defined in part by the local situation, especially regarding ventilation. At room temperature in a well ventilated room, a few hundred milliliters might be considered a small spill. Toxic formaldehyde vapors are generated during a spill and may exceed OSHA's Permissible Exposure Limits. Wear protective gloves, rubber boots, impermeable aprons and full-face respirators. Use a damp sponge or mop to remove spilled liquid, or neutralize with a commercial kit. Wash contaminated area with water. Discard absorbents and other contaminated solids in a receptacle suitable for hazardous chemical waste. Liquid waste may be discarded down the drain with approval by wastewater authorities, or may be removed by a licensed waste hauler.

With large spills, evacuate the area and have an emergency response team perform the cleanup. Have a licensed waste hauler remove contaminated solids and recovered liquid.

Comply with all applicable governmental regulations on spill reporting and on the handling and disposal of hazardous waste.

7. HANDLING AND STORAGE

Handling: Wear a plastic or rubber apron, protective gloves and splash-proof goggles; this is mandated by OSHA. Avoid all contact with skin and eyes. Do not continue to wear contaminated clothing after a spill. Do not heat or microwave the solution, as vapor levels may become immediately dangerous to life and health.

Storage: Store at room temperature.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Good general room ventilation is essential. Product should be used with local ventilation (fume hood).

Personal protective equipment

Respiratory protection: A NIOSH-approved respirator suitable for formaldehyde must be used if vapor levels exceed the exposure limits.

Skin protection: OSHA mandates the use of gloves; Anatech Ltd. recommends nitrile gloves. Do not use latex surgical gloves for protection against any hazardous liquid. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

Eye protection: OSHA mandates the use of splash-proof goggles. Do not use safety glasses. If a face shield is worn as protection against biohazards, splash-proof goggles also must be used. Anatech Ltd. believes that the use of contact lenses is ill advised when handling formaldehyde solutions. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Colorless liquid.

Odor: Pungent (formaldehyde) odor.

Physical state: Liquid.

pH: 6.8 - 7.2 (concentrate); 6.8 - 7.2 (diluted).

Vapor pressure: Not determined.

9. PHYSICAL AND CHEMICAL PROPERTIES (continued)

Vapor density: Not determined.

Boiling point: 207°F (97°C) (concentrate); 207°F (97°C) (diluted).

Freezing point: Not determined (concentrate); not determined (diluted).

Solubility in water: Complete.

Specific gravity: 1.097 at 20°C (concentrate); 1.020 at 20°C (diluted).

10. STABILITY AND REACTIVITY

Chemical stability: Stable.

Conditions to avoid: Heating this solution will give off irritating and potentially life-threatening vapors.

Incompatibility with other materials: Strong oxidants, ammonia, chlorine bleach or hydrochloric acid.

Hazardous decomposition products: None.

Hazardous polymerization: None.

11. TOXICOLOGICAL INFORMATION

Acute eye effects: Eye irritation threshold in humans is 3-10 ppm; lacrimation and discomfort at lower levels in some individuals; contact with the solution may fix the cornea and surrounding tissue. In rabbits, 50 µg of 37% formaldehyde solution over 24 hours produced severe irritation.

Acute skin effects: Contact with the solution may fix the skin, killing surface cells and causing drying, hardening and cracking.

Acute oral effects: OSHA considers chemicals to be toxic if their LD_{50} is at or below 500 mg/kg. LD_{50} is the dose killing 50% of the test animals in a given time (usually 4 hours); LD_{Lo} is the lowest dose causing death. Using 37% formaldehyde solution, the LD_{50} was 260 mg/kg in guinea pigs, 800 mg/kg in rats and 42 mg/kg in mice. In humans, the LD_{Lo} is 108 mg of 37% formaldehyde solution/kg.

Acute inhalation effects: OSHA considers chemicals to be toxic if their LC_{50} is at or below 20 mg/kg. LC_{50} is the airborne concentration killing 50% of the test animals; LC_{Lo} is the lowest concentration causing death. Using 37% formaldehyde solution, the LC_{50} was 590 mg/kg; the LC_{Lo} in humans was 17 mg/kg.

Chronic effects/carcinogenicity: Formaldehyde is an OSHA carcinogen and sensitizer.

Teratology: None known.

Reproductive effects: None known.

Mutagenicity: Positive.

12. ECOLOGICAL INFORMATION

Ecotoxicity: The following data are from studies using 37% formaldehyde in flow-through bioassays.

Rainbow trout: 96 hr LC_{50} = 118 µl/l
Atlantic salmon: 96 hr LC_{50} = 173 µl/l
Lake trout: 96 hr LC_{50} = 100 µl/l
Black bullhead: 96 hr LC_{50} = 62.1 µl/l
Channel catfish: 96 hr LC_{50} = 65.8 µl/l
Green sunfish: 96 hr LC_{50} = 173 µl/l
Bluegill: 96 hr LC_{50} = 100 µl/l
Smallmouth bass: 96 hr LC_{50} = 136 µl/l
Largemouth bass: 96 hr LC_{50} = 143 µl/l

Environmental fate: Formaldehyde is oxidized to formic acid, then to carbon dioxide and water, or reduced to methanol, then to carbon dioxide and water. Phosphate salts may contribute to eutrophication.

13. DISPOSAL CONSIDERATIONS

The concentrate is toxic (formaldehyde); the diluted solution is toxic. Both should be disposed via a licensed waste hauler. Do not mix waste streams unless instructed to do so by your waste hauler. Some wastewater treatment authorities may grant permission for drain disposal of limited amounts of concentrate or diluted solution. Phosphate salts may be a consideration in drain disposal. Diluted CB Formalin is recyclable and can be neutralized with commercially available detoxification products.

Canadian disposal regulations generally parallel those in the United States.

Regardless of the method chosen for disposal, be sure to follow federal, state (provincial) and local regulations. Proper waste disposal is the generator's responsibility.

14. TRANSPORTATION INFORMATION

Packaging for hazardous shipments must meet the specifications as required by the current editions of *International Air Transportation Association (IATA) Dangerous Goods Regulations* and the United States Department of Transportation *49 CFR*.

For product as sold (concentrate)

DOT (ground): Not regulated.

DOT (air) and IATA:
Proper Shipping Name: Formaldehyde solution, flammable
UN #: 1198
Hazard Class: 3
Packing Group: III

For diluted solution

DOT (ground): Not regulated.

DOT (air) and IATA:
Proper Shipping Name: Aviation regulated liquid, n.o.s. (formaldehyde)
UN #: 3334
Hazard Class: 9
Packing Group: None assigned.

15. REGULATORY INFORMATION

OSHA (USA): Under the Hazard Communication Standard, the Formaldehyde Standard and the Laboratory Standard, the product as sold is a hazardous material: it is an irritant, sensitizer and carcinogen, and it is toxic.

Properly diluted CB Formalin shares those hazard ratings.

Both the concentrate and the diluted solution are required to bear the OSHA hazard warning for formaldehyde:

> Caution. Contains formaldehyde. Toxic by inhalation and if swallowed. Irritating to the eyes, respiratory system, and skin. May cause sensitization by inhalation or by skin contact. Risk of serious damage to eyes. Potential cancer hazard; repeated or prolonged exposure increases the risk.

The three OSHA Standards cited above mandate that exposed workers be monitored for formaldehyde exposure, and receive proper training in the properties of this product, work practices involved with its handling and disposal, and interpretation of its MSDS. Customers who in turn send this product on to their clients or satellite facilities must supply an MSDS at least with the initial shipment. This MSDS is suitable for either the product as sold or the properly diluted solution.

FDA (USA): CB Formalin is for in vitro diagnostic use as a fixative in histology.

EPA (USA): For disposal purposes, CB Formalin is toxic and ignitable. Properly diluted CB Formalin is toxic. Formaldehyde is a reportable substance under SARA Title III.

16. OTHER INFORMATION

Label warnings: Caution. Contains formaldehyde. Toxic by inhalation and if swallowed. Irritating to the eyes, respiratory system, and skin. May cause sensitization by inhalation or by skin contact. Risk of serious damage to eyes. Potential cancer hazard; repeated or prolonged exposure increases the risk. Avoid extensive or repeated contact. Use with adequate ventilation. If swallowed, contact a physician.

NFPA (National Fire Protection Association) Rating:

General note: This rating is applicable only to safeguard the lives of individuals who may be concerned with fires occurring in an industrial plant or storage location. The ratings provide information to emergency personnel on whether to evacuate the area or how to perform control procedures. It is not descriptive of hazards under normal conditions of occupational use, and is even less applicable to anticipated laboratory-scale use.

For product as sold (concentrate)

Health 2: Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Flammability 2: Materials that must be moderately heated or exposed to relatively high ambient temperatures before ignition can occur.

Instability 0: Materials that are normally stable even under fire conditions.

For diluted solution

Health 2: Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Flammability 1: Materials that must be preheated before ignition can occur.

Instability 0: Materials that are normally stable even under fire conditions.

MATERIAL SAFETY DATA SHEET

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product name: FORMALDETOX

Catalog number: 202

General use: Detoxifies formalin solutions.

Product description: White granules of sodium percarbonate.

Manufacturer	Emergency contact information			
Anatech Ltd. 1020 Harts Lake Road Battle Creek, MI 49015 USA	Health: Transportation:	Anatech Ltd. CHEMTREC	800-262-8324 800-424-9300	8 am - 5 pm ET, M-F 24 hours

2. COMPOSITION AND INFORMATION ON INGREDIENTS

(Note: Percentage composition is withheld as a trade secret.)

Component	CAS #	Exposure limits
Sodium percarbonate	156630-89-4	Not established.
Sodium carbonate	497-19-8	Not established.
Sodium metasilicate	7722-84-1	Not established.

3. HAZARDS IDENTIFICATION

Emergency overview

White granules of sodium percarbonate; a mild oxidizer.

Not likely to pose a hazard under normal conditions of use.

Potential health effects

(Human health effects only.)

Primary route(s) of exposure: Eyes.

Inhalation: Slight nose and throat irritant.

Eye: Severe eye irritant. Can cause burns to eyes.

Skin: Slight irritant.

Ingestion: Severe irritant of the mouth, throat, esophagus and stomach.

3. HAZARDS IDENTIFICATION (continued)

Chronic effects: Prolonged and repeated inhalation can cause sore throat, nose bleeds and chronic bronchitis. Repeated skin contact can cause dermatitis.

Signs and symptoms: Eyes may water and become reddened. Inhalation can cause coughing. Ingestion will result in bloating of stomach, nausea, vomiting.

4. FIRST AID MEASURES

Inhalation: Remove victim to fresh air if coughing or difficulty in breathing is experienced. Consult a physician if symptoms persist or worsen. Administer oxygen or artificial respiration as needed.

Eye: Flush eyes for at least 15 minutes in an eyewash station. If symptoms persist after washing, consult a physician.

Skin: Remove contaminated clothing, including footwear; wash before reuse or discard. For minor exposure, wash affected area with water and mild soap, rinsing thoroughly; apply a good quality skin lotion. In cases of prolonged, repeated or extensive exposure, rinse affected area or entire body for at least 15 minutes. For severe conditions, consult a physician.

Ingestion: Call a poison control center immediately. If victim is conscious, have him/her drink several glasses of water to dilute the solution. Induce vomiting only upon the advice of a physician or poison control authority.

5. FIRE FIGHTING MEASURES

Flammable properties

Flash point: Not applicable.

Flammable limit: Not applicable.

Autoignition temperature: Not applicable.

Flammability classification: Nonflammable.

Flame propagation: None.

Hazardous products of combustion: Decomposition from exposure to moisture liberates oxygen and generates heat which can support combustion. Decomposes with heat to liberate oxygen which also may cause a pressure burst if material is confined.

Extinguishing media: ABC rated portable fire extinguishers should be used. Professional fire fighters may use water spray, dry chemical or carbon dioxide.

Fire fighting instructions: Sealed chemical suits and self contained breathing apparatus are necessary for fighting fires involving substantial volumes of this product.

6. ACCIDENTAL RELEASE MEASURES

Remove dry granules. Wash affected area with water.

Comply with all applicable governmental regulations on spill reporting and on the handling and disposal of hazardous waste.

7. HANDLING AND STORAGE

Handling: No special precautions required.

Storage: Store at room temperature. Store in a dry place in original container away from excessive heat. Do not allow contamination with moisture or heavy metal salts.

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

Engineering controls: Good general room ventilation is essential.

Personal protective equipment

Respiratory protection: Generally not needed, but a NIOSH-approved particle mask may be used if desired.

Skin protection: Use protective gloves when handling this powder. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

Eye protection: Use splash-proof goggles. Do not use safety glasses. An eyewash station and safety shower must be nearby, preferably in the same room, no more than 10 seconds away.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance: White granules.

Odor: None.

Physical state: Solid.

pH: Not applicable.

Vapor pressure: Not applicable.

Vapor density: Not applicable.

Melting point: Not applicable.

Boiling point: Not applicable.

Solubility in water: 140 g/l @ 24°C (75°F)

Specific gravity: Not applicable.

10. STABILITY AND REACTIVITY

Chemical stability: Slow release of oxygen is normal.

Conditions to avoid: Heat and moisture.

Incompatibility with other materials: Water, acids, bases, salts of heavy metals, reducing agents, organic materials and flammable substances.

Hazardous decomposition products: Oxygen; decomposition releases steam and heat.

Hazardous polymerization: None.

11. TOXICOLOGICAL INFORMATION

Acute eye effects: The material produced severe damage when administered to rabbit eyes.

Acute skin effects: The material produced slight irritation when applied to rabbit skin. No sensitization was noted when administered as a 75% w/v mixture during induction and as a 25% w/v mixture at challenge.

Acute oral effects: OSHA considers chemicals to be toxic if their LD_{50} is at or below 500 mg/kg. LD_{50} is the dose killing 50% of the test animals in a given time (usually 4 hours). LD_{50} was 14,034 mg/kg in rats.

Acute inhalation effects: OSHA considers chemicals to be toxic if their LC_{50} is at or below 20 mg/kg. LC_{50} is the airborne concentration killing 50% of the test animals. LC_{50} was > 4,580 mg/m^3 in rats.

Chronic effects/carcinogenicity: None known.

Teratology: None known.

Reproductive effects: None known.

Mutagenicity: None known.

12. ECOLOGICAL INFORMATION

Ecotoxicity:

Fish
Pimephales promelas: LC_{50}: 70.7 mg/l
Pimephales promelas: 96 hr NOEC: 1 mg/l
Crustaceans
Daphnia pulex: EC_{50}: 4.9 mg/l
Daphnia pulex: 48 hr NOEC: 1 mg/l

Environmental fate: Toxic for aquatic organisms. The hazard for the environment is limited because it does not bioaccumulate, and it degrades abiotically into products of low toxicity.

13. DISPOSAL CONSIDERATIONS

Dissolve in water and pour down the drain. Aqueous solutions are not hazardous.

14. TRANSPORTATION INFORMATION

Packaging for hazardous shipments must meet the specifications as required by the current editions of *International Air Transportation Association (IATA) Dangerous Goods Regulations* and the United States Department of Transportation *49 CFR*.

DOT (ground and air) and IATA: **Proper Shipping Name**: Sodium carbonate peroxyhydrate
UN #: 3378
Hazard Class: 5.1
Packing Group: II

15. REGULATORY INFORMATION

OSHA (USA): Under the Hazard Communication Standard and the Laboratory Standard, this product is a hazardous material: it is an eye irritant. The OSHA Standards cited mandate that exposed workers receive proper training in the properties of this product, work practices involved with its handling and disposal, and interpretation of its MSDS.

FDA (USA): Not applicable.

EPA (USA): Formaldetox is a reportable substance under SARA Title III.

16. OTHER INFORMATION

Label warnings: Severe eye irritant. Keep off mucous membranes.

NFPA (National Fire Protection Association) Rating:

General note: This rating is applicable only to safeguard the lives of individuals who may be concerned with fires occurring in an industrial plant or storage location. The ratings provide information to emergency personnel on whether to evacuate the area or how to perform control procedures. It is not descriptive of hazards under normal conditions of occupational use, and is even less applicable to anticipated laboratory-scale use.

Health 2: Materials that, under emergency conditions, can cause temporary incapacitation or residual injury.

Flammability 0: Materials that will not burn under typical fire conditions, including intrinsically noncombustible materials such as concrete, stone, and sand.

Instability 1: Materials that in themselves are normally stable, but that can become unstable at elevated temperatures and pressures.

Special: OX

PRODUCT INFORMATION

FORMALDETOX

INTENDED USE

FORMALDETOX is intended to be used to destroy the hazardous component of histological solutions of 10% formalin (3.7% formaldehyde) so that the resulting mixture can be discarded into a sanitary sewer system. Users should obtain approval from local wastewater (sewage) treatment plants before disposing of detoxified formalin in this manner. FORMALDETOX can be used on unbuffered formalin, neutral buffered formalin, unbuffered zinc formalin and buffered zinc formalin (ANATECH's Z-FIX). See special instructions below for zinc-containing solutions. FORMALDETOX will also detoxify the residue remaining after distillation of any of these formalin solutions in B/R Instrument's PureForm 2000™ Formalin Recycling System. Do not use FORMALDETOX with alcoholic formalin. Other formulations may or may not be suitable for detoxification (see below).

MECHANISM OF ACTION

FORMALDETOX oxidizes formaldehyde to formic acid and immediately neutralizes it to sodium formate. Byproducts of the reaction are sodium carbonate, sodium bicarbonate, carbon dioxide and water. Methanol (present as a stabilizer in most formalin solutions) is also oxidized to sodium formate. Phosphate buffer salts will remain unchanged. The pH of the detoxified solution will range from 7.5-9.2, and will not need neutralization prior to drain disposal.

Zinc compounds may interact with FORMALDETOX, making it less efficient, and should be removed prior to detoxification. The extent of interaction varies with the type of zinc salt used in the formulation. If left in the solution, zinc will be precipitated as oxides, hydroxides and carbonates.

Warm water is added to the waste formalin in a 1:1 ratio to control the rate of reaction. The reaction is exothermic (produces heat), so the solution will warm to 55-70° C, depending upon the starting temperature. The final level of destruction is dependent upon temperature, so warm (but not hot) water is recommended.

FORMALDETOX is effervescent and requires no mixing when in solution.

OBTAINING LOCAL APPROVAL

The US EPA allows onsite treatment of hazardous waste using pH neutralization, precipitation and oxidation/reduction reactions[1]. Formaldetox uses an oxidation/reduction reaction. Removing zinc from solution is a precipitation reaction. Therefore, Formaldetox can be used as directed according to the EPA. That said, there are a few states that narrow the scope of disposal options. Alabama, Massachusetts and Rhode Island prohibit onsite treatment. Several others place quantity and/or reporting restrictions on onsite treatment: Arkansas, Colorado, Maine, Maryland, New Hampshire and New Mexico. Your wastewater treatment authority should be able to advise you of your state's regulations.

While the detoxified solution is nonhazardous by most criteria, it is prudent to check with your local wastewater treatment plant (POTW, or publicly owned treatment works) before using FORMALDETOX. Contact the Plant Manager and inform him/her of what you wish to do. State that 3 gallons of pretreated formaldehyde waste will be discarded at a time, and that this will occur periodically (tell how many times per week or month). Provide the manager with copies of the analysis (see below) and the MSDS for the detoxified solution. Inquire if the solution can be poured down the drain at one time or if it should be trickled into the system over a period of an hour or more.

Some POTW's will accept 3.7% formaldehyde in small quantities. Others will not accept solutions exceeding 0.1 ppm (0.1 mg/lt, or 0.00001%) formaldehyde. FORMALDETOX will produce a solution containing less than 100 ppm (mg/lt), providing there is no zinc present. If detoxification produces a solution that is still above allowable limits set

[1] US Environmental Protection Agency, 2000. *Environmental Management Guide for Small Laboratories*. EPA 233-B-00-001

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by your POTW, consider trickling the solution into the drain over a period of time. You are not allowed to add more water to the waste for the purpose of diluting it below acceptable limits; however, you can take advantage of the normal flow of wastewater through your facility's drain pipes.

As an example of this, assume that your detoxified solution contains 100 ppm (mg/lt) formaldehyde, that your POTW sets a limit of 1 ppm (mg/lt) formaldehyde, and that your facility discharges 200 gallons of wastewater to the sewer each hour. By trickling the detoxified formalin solution into the drain for an hour, you will passively dilute it 200 fold, and the wastewater entering the public sewer system will contain 0.5 ppm (mg/lt). This is one half of the acceptable limit, and should be permissible. Your POTW will probably know your daily discharge rate unless your facility is very small.

If you need to trickle the solution into the drain, obtain a spigot (ANATECH Cat.# 001) for the REACTION DRUM. Adjust this spigot so that it drips at a suitable rate. This spigot must not be on the REACTION DRUM during the detoxification process, as it will block the release of gases.

ANALYSIS OF DETOXIFIED SOLUTIONS

Typical analysis of a detoxified solution of zinc-free, 8-10% formalin yields the following:

sodium formate..... < 4.2 %	sodium carbonate & bicarbonate ..... 7.9 %
formaldehyde..... < 100.0 ppm (mg/lt)	sodium sulfate ..... < 0.7 %
methanol..... < 0.65 %	pH..... 7.5-9.2

For phosphate-buffered neutral formalin, there will also be:

sodium phosphate, monobasic and dibasic..... 6.2 %

DIRECTIONS FOR USE

Optimal results can only be obtained when detoxification is performed according to these simple directions. To guarantee safety and efficacy, the reaction must be carried out in the special REACTION DRUM (Cat. # 203).

General Instructions

1. Wear safety goggles (not glasses), gloves and an impervious apron, as mandated by OSHA in the Formaldehyde Standard. This is for protection against formaldehyde.
2. Remove zinc if present. If the solution does not contain zinc, proceed to Step 3.
   a. Dissolve 25 g monobasic sodium phosphate, monohydrate in 500 ml warm, deionized or distilled water. Note #1: Do not use dibasic or tribasic sodium phosphate because the precipitate will be difficult to filter.

      Note #2: This amount of monobasic sodium phosphate is suitable for ANATECH's zinc products; other brands may require additional phosphate. Call us for assistance in determining the correct amount to use.

   b. Add the phosphate solution to 1.5 gallons of waste formalin that contains zinc.
   c. Allow the mixture to react for an hour.
   d. Filter the solution through a conical coffee filter paper into the REACTION DRUM. We recommend a #6 filter for Melita coffee makers in an 8 inch diameter plastic funnel. Laboratory filter paper (Whatman) is too slow. Perform the filtering operation in a well ventilated area, preferably under a fume hood. You may filter the solution directly into the REACTION DRUM.
   e. Rinse the precipitate with a small amount of tap water to wash the formaldehyde from the filter.
   f. Discard the filter paper with precipitate in the general trash. The precipitate consists of oxides, hydroxides and phosphates of zinc, all of which generally are considered nonhazardous for this means of disposal.
   g. Proceed to Step 4 with zinc-free waste formalin in the REACTION DRUM.

3. Fill the REACTION DRUM to the lower (1.5 gallon) mark with waste formalin (if not already present from Step 2. Note Special Instructions below.
4. Fill to the upper (3.0 gallon) mark with lukewarm (20-30° C) tap water (or add 1.5 gallons of lukewarm water). Do not use cold (< 20° C) water (the reaction will be incomplete) or hot (> 30° C) water (the reaction will proceed too fast and the solution will get too hot).
5. Add two containers of FORMALDETOX. Do not stir or shake the mixture; the granules will dissolve slowly with effervescence.
6. Cap the REACTION DRUM with the vapor scrubber, or place the uncapped drum inside a fume hood. Do not use the spigot or any other cap to close the opening in the drum.
7. Allow the reaction to proceed for 8 hours or longer (overnight is usually convenient).
8. Discard the solution down the drain if given approval by appropriate officials. If the solution must be trickled into the drain, replace the vapor scrubber with a self-venting spigot (ANATECH Cat. # 001). The copious, white, fluffy precipitate is undissolved sodium carbonate and may be poured down the drain without filtering.

Special Instructions

Most waste formalin is not rich enough in dissolved solids to cause problems when used as directed above. However, waste formalin that has had a large amount of tissue stored in it for prolonged periods is likely to foam excessively. Macromolecules trap the tiny bubbles of carbon dioxide that are generated during the reaction, producing foam that is sometimes too copious to be contained by the drum. The solution has not boiled over (the temperature is not that high), it has simply foamed over. If this occurs, replace the charcoal in the vapor scrubber. In particular, beware of waste formalin that has been used to fix placentas and other very bloody specimens. Still bottoms from formalin recycling stills will also be rich in dissolved macromolecules. In these cases, follow these special directions:

1. Add 0.75 gallons of waste formalin to the reaction drum.
2. Add water (20-30° C) to the 3.0 gallon mark.
3. Add one tube of FORMALDETOX to the solution.
4. Allow the reaction to proceed as usual.

Warnings

1. Wear splashproof safety goggles (not glasses), gloves and impervious apron when removing zinc and when filling the REACTION DRUM to protect against formaldehyde. Goggles are recommended when discarding the detoxified solution to avoid possible eye injury (sodium carbonate is an eye irritant). Wear an apron at this time as well to keep from getting sodium carbonate on your clothes; it will not harm them but will create white spots after it dries. If that occurs, remove the spots with warm water.
2. The directions are designed to create a carefully controlled reaction. Failure to heed these warnings constitutes misuse of the product.
   a. DO NOT detoxify waste containing more than 10% formalin (3.7% formaldehyde).
   b. DO NOT detoxify more than 1.5 gallons of waste at a time.
   c. DO NOT use hot water.
   d. DO NOT mix or shake the solution.
   e. DO NOT use more than two containers of FORMALDETOX at a time.

   Note #3: All of these actions will increase the rate of heat production and could cause the solution to boil. While the REACTION DRUM will contain 3 gallons of solution if it boils, the heat could cause thermal burns to anyone touching the drum. If more than 3 gallons of solution boils, it could spill out the vapor scrubber and/or vent.

3. DO NOT cap the drum with a conventional sealed cap; always use the vapor scrubber (or leave the drum uncapped if conducting the reaction in a fume hood). Gases (mostly carbon dioxide) are given off during the reaction, and must be allowed to escape. The small colored plug in the top of the drum is a safety device designed to pop out if too much pressure builds up because of misuse of the cap.
4. DO NOT use FORMALDETOX as a detoxification agent for any chemical other than formaldehyde.

Additional information on formalin solutions containing zinc

ANATECH's zinc products contain 600 ppm (mg/l) of zinc ions. If zinc is allowed to remain in the waste during detoxification, the final concentration will be less than 300 ppm (mg/l) zinc. Your local POTW may or may not allow that much zinc to be introduced into the sewer system. If it is allowed, you may still wish to remove it prior to detoxification because of the inhibiting effect zinc salts have on the detoxification reaction. Different zinc formulations influence the reaction in various ways. Our products produce the following effects:

	Formaldehyde content after detoxification	
Zinc fixative	**Zinc not removed**	**Zinc removed**
ZINC FORMALIN	<100 ppm	<100 ppm
Z-FIX	250-500 ppm	<100 ppm

Other formulations may affect the reaction differently. If you wish to use FORMALDETOX on them without removing the zinc, please give us a call. We will test the solution before detoxification and will then advise you on the proper course of action.

Special directions for detoxifying stillbottoms from formalin recycling operations

The residue (stillbottoms) left after distillation of waste formalin in B/R Instrument's PureForm 2000™ Formalin Recycling System can be detoxified in the same manner as regular formalin. Simply follow the standard directions.

CARE OF THE VAPOR SCRUBBER

The scrubber contains a column of activated charcoal which should function satisfactorily for a number of reactions. When formaldehyde odors become noticeable, replace the charcoal. Carefully unscrew the cylindrical portion of the scrubber and discard the charcoal. Replace it with 8-20 mesh activated charcoal, such as Sigma Cat.# C2889. When reassembling the unit, place rubber gasket on the upper piece and screw the top of the scrubber into place. Place the used charcoal in a plastic bag and discard it in an appropriate manner.

STORAGE, HANDLING AND DISPOSAL OF UNUSED FORMALDETOX

Store at room temperature. Keep dry. If FORMALDETOX becomes wet, or if you wish to dispose of it, dissolve it in tap water and pour the solution down the drain after 24 hours. At that point it will contain only sodium carbonate, sodium bicarbonate and sodium sulfate. Spills should be treated in the same manner. The white residue left when splashes dry is sodium carbonate, sodium bicarbonate and sodium sulfate, and is harmless.

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